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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Manu Gulati

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08/21/2008

GARLICK HARRISON & MARKISON

P.O. BOX 160727

AUSTIN, TX 78716-0727

EXAMINER

CHU, WUTCHUNG

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/685,231	Applicant(s) GULATI ET AL.	
	Examiner WUTCHUNG CHU	Art Unit 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-15,17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-15,17,19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/29/2008 has been entered.

Response to Amendment

2. This communication is in response to application's amendment filed on 7/29/2008. Claims 1-7, 9-15, 17, 19-20 are pending, and claims 8, 16, 18, and 21 are canceled.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6, 9-15, 17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Cremin et al., hereinafter Cremin, (US2002/0018444).

Regarding claim 1, Cremin discloses a method and apparatus for multi-lane communication channel with deskewing capability (**see paragraph 21**) comprising:

- a data aligner to receive data (**see figure 6 box 623 data alignment**), having a first data format of a first byte-length granularity and a second data format of a second byte-length granularity where the first and second byte-length granularity are different (**see paragraphs 22 and 23 where 48 bit input word at input, increases the width of the data word being processed by the communication channel to 64bits**), from a data transmission link having a first data width (**see paragraph 22 48 bit input word**) and to align the data into predefined segments for interim storage (**see figure 2 ref223a and paragraph 31 data alignment units**), based on storage devices in which each storage device has a single read port and a single write port of a fixed byte length (**see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26**); and
- a buffer (**see figure 8 and ref 801-3 queues**), formed from the storage devices, to receive aligned data from the data aligner for interim storage and to reassemble data output onto a data path having a second data width that is wider than the first data width (**see paragraphs 23 and 27 64 bit input word, and after a 64 bit word is read from the queue it is fanned out in pieces to each of the eight lanes and also see figure 2 where input comes in as 48bit arrow 202, and leaves the queue arrow 207 in 64 bit word**), the buffer to allow storage of aligned data in wider format (**see paragraph 70 word width expansion unit and figure 2 ref 208**) to maintain sufficient bandwidth to account for frequency scaling of received data rate to frequency of the data path, based

on the first and second byte-length granularity of the received data, and process fragmentation of data for alignment onto the data path **(see paragraph 39 the input word expansion unit can only provide information at a data rate sufficient to fill fifteen units)** by storing the fragmentation in a next selected storage device, the buffer to use the storage devices **(see figure 8 ref801-3 and paragraph 68 FIFO queues)** in a cyclic manner **(see paragraph 59 rotating multiplexing)** based on the byte-length granularity of the received data, in which buffering of the received data of different byte-length granularity **(see paragraphs 22-24)** is achieved using storage devices having the single read port and the single write port **(see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26 a memory having logic that reads and writes data from /to the memory in a manner that is consistent with the operation of a queue).**

Regarding claim 2, Cremin teaches the storage devices are arranged in arrays **(see figure 8 ref801-3).**

Regarding claim 3, Cremin teaches further including a command control logic to separate commands from data at an input to the data aligner and to process commands to align the data **(see paragraph 57).**

Regarding claim 4, Cremin teaches further comprises a data re-aligner at the buffer output, data entry may start in any one of the arrays and an orientation bit or bits is to

be used to identify the starting array for realignment in the data re-aligner **(see figure 8 ref801-3 and paragraph 68-69)**.

Regarding claim 5, Cremin teaches further including a meta-data unit to receive meta-data from the command control logic and to use the meta-data to realign the data in the data re-aligner **(see paragraph 68-69)**.

Regarding claim 6, Cremin teaches further comprising a data fragment collector to collect fragments of data that do not fit into the predefined segment in one clock period and to use the fragment in a next clock period to fit into a next segment **(see paragraph 22)**.

Regarding claim 9, Cremin teaches an integrated circuit comprising:

- an interface unit to receive incoming data from a higher frequency data transmission link having a first data width **(see paragraph 22 48 bit input word and figure 2 arrow 202)** for use by the integrated circuit **(see figure 2 box 202 and paragraphs 22 and 81)**, the incoming data having a first data format of a first byte-length granularity and a second data format of a second byte-length granularity where the first and second byte-length granularities are different **(see paragraphs 22 and 23 where 48 bit input word at input, increases the width of the data word being processed by the communication channel to 64bits)**;

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- a command control unit to receive incoming data from the interface unit and to separate commands from data to process commands to align the data (**see paragraph 57**);
- a data aligner to receive incoming data from the interface unit and to align the incoming data into a predefined segment for interim storage (**see figure 2 ref223a and paragraph 31 data alignment units**), based on storage devices in which each storage device has a single read port and a single write port of a fixed byte length (**see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26**); and
- a reassembly buffer, formed from the storage devices (**see figure 8 and ref 801-3 queues**), to receive aligned data from the data aligner for interim storage and to reassemble data output onto an internal data path having a second data width that is wider than the first data width (**see paragraphs 23 and 27 64 bit input word, and after a 64 bit word is read from the queue it is fanned out in pieces to each of the eight lanes and also see figure 2 where input comes in as 48bit arrow 202, and leaves the queue arrow 207 in 64 bit word**), the reassembly buffer to allow storage of aligned data in wider format (**see paragraph 70 word width expansion unit and figure 2 ref 208**) to maintain sufficient bandwidth to account for frequency scaling of received data rate to frequency of the internal data path,

- based on the first or second byte-length granularity of the received data, and process fragmentation of data for alignment onto the internal data path (**see paragraph 39 the input word expansion unit can only provide information at a data rate sufficient to fill fifteen units**) by storing the fragmentation in a next selected storage device, the buffer to use the storage devices (**see figure 8 ref801-3 and paragraph 68 FIFO queues**) in a cyclic manner (**see paragraph 59 rotating multiplexing**) based on the byte-length granularity of the incoming data, in which buffering of the incoming data of different byte-length granularity (**see paragraphs 22-24**) is achieved using storage devices having the single read port and the single write port (**see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26 a memory having logic that reads and writes data from /to the memory in a manner that is consistent with the operation of a queue**).

Regarding claims 10, 12-14, Cremin disclose all the limitations as discussed in the rejection of claims 2, 4-6 and are therefore claims 10-16 are rejected using the same rationales.

Regarding claim 11, Cremin the reassembly buffer is structured having multiple matrices arranged into arrays, in which a width of the individual matrix is determined by the second data width of the (**see paragraphs 23 and 27 64 bit input word, and after a 64 bit word is read from the queue it is fanned out in pieces to each of the eight lanes and also see figure 2 where input comes in as 48bit arrow 202, and leaves**

the queue arrow 207 in 64 bit word) internal data path (see Cremin paragraph 57 and 70).

Regarding claims 17 and 19, Cremin disclose all the limitations as discussed in the rejection of claims 1 and 4 and are therefore claims 17-19 are rejected using the same rationales.

Claim Rejections - 35 USC § 103

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cremin in view of Richter (US2003/0099254).

Regarding claim 7, Cremin discloses all the subject matter of the claimed invention with the exception of first data format is based on SPI-4 protocol and the second data format is based on HyperTransport protocol.

Richter from the same or similar fields of endeavor teaches the use of SPI-4 (**see Richter paragraph 141**) and HyperTransport (**see Richter paragraph 117**). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the SPI-4 and HyperTransport as taught by Richter in the apparatus for multi-lane communication channel with deskewing capability of Cremin in order to provide optimization for a particular system application, providing further performance improvements (**see Richter paragraph 117**).

Regarding claims 15, Cremin disclose all the limitations as discussed in the rejection of claims 7 and is therefore claims 15 is rejected using the same rationales.

Regarding claims 20, Cremin disclose all the limitations as discussed in the rejection of claim 7 and is therefore claim 20 is rejected using the same rationales.

Response to Arguments

8. Applicant's arguments filed 7/29/2008 have been fully considered but they are not persuasive.

With regard to applicant's remark for claims 1, 9, and 17 (page 7), applicant submits that the Cremin fails to teach "a first data width, in which a first data format is of a first byte-length granularity and a second data format is of a second byte-length granularity, where the first and second byte-length granularities are different".

Cremin in figure 2 illustrates a arrow 202 48 bit input and arrow 207 64 bit output, which corresponds to the first and second data format where second data format is wider than the first, which is also stated in paragraphs 22-27, and thus meets the limitation and rejection respectfully remains.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wu (US2003/0095563)

Lalmiki et al. (US6975324)

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WUTCHUNG CHU whose telephone number is (571)270-1411. The examiner can normally be reached on Monday - Friday 1000 - 1500EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WC/
Wutchung Chu

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2619